

Turkey Litter To Energy Gasification Demonstration



Presented by

Recovered Energy Resources, Inc.

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Turkey Litter To Energy Gasification Demonstration

Litter gasification demonstration was conducted under grant funding from Xcel Energy

Objective was to learn the characteristics and applicability of using turkey litter as a renewable fuel resource

Final report will show the potential to produce electrical power in the Minnesota service area of Xcel Energy using turkey litter

Turkey Litter To Energy Gasification Demonstration

- Test and Development work conducted by:
Coaltec Energy
Recovered Energy Resources
AURI
Southern Illinois University, Carbondale
- Turkey Litter Provided by:
Walcott Farms, Allendale Michigan

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- Work began with delivery of litter to McVicker Recycling, Marion, Ill
- Two loads, approx. 25 tons each were delivered



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- 12 ton loads of litter transferred to test facility in Cartersville



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Coaltec Energy Carterville Illinois Gasification Test Facility

- Full-scale 25+ million Btu per hour gasifier
- Designed for fuel testing and gasification development



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- Gasifier was loaded 1100 lbs. per bucket by front end loader
- Four buckets per hour, or ~2.2 tons per hour fed into the gasifier
- No processing of the litter was done prior to loading
- No significant odor was noted throughout duration of test from either litter pile or plant emissions



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- Gasifier fed via a 4 auger system
- Gasifier operated without interruption continuously for 2 days
- Evening turndown was demonstrated
- No supplemental fuel was used once gasification began



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- General Performance

No significant emissions,
calcium did produce some
visible emission, easily
corrected with baghouse

High ash quality with no
clinkers

High overall system
efficiency



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- Emissions Monitored: CO, CO₂, NO_x, SO₂
 - All emissions very low, posing no commercial problems
 - NO_x and SO₂ were noted as exceptionally low
 - Some visible calcium emissions, easily controlled
- Ash Quality
 - Consistent fine grain powdery composition
 - High percentage of phosphorus in ash
 - No problems removing from gasifier
 - Potentially saleable material

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- Gasifier Thermal Performance
 - Consistent heat production
 - Steady 1,800 Deg. F oxidizer performance
 - Stack temperature ~270 Deg. F
- Thermal throughput
 - 21,000,000 Btu/hr based on Btu value of litter

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- Potential Uses of Thermal Energy
 - Steam production for space and process heating
 - Electrical energy generation
 - Heating of grow-out houses
 - Producing chilled water for grow-out house cooling

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- Next Steps
 - Completion of Xcel Energy report
 - Evaluation of end-user application
 - Complete plant engineering
 - Construct first turkey litter-to-energy project (MI)
 - Use test data for development of farm scale poultry litter-to-energy system (currently underway in WV)

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